

# THE STANDARDIZATION OF PEDIGREES.

## A RECOMMENDATION.

In view of the infinite number of ways in which pedigrees may be drawn up it was recently thought desirable that the Research Committee of the Eugenics Education Society should consider what in their opinion was the best scheme among those in use. It would clearly be of advantage if everyone would use the same method provided the method was a good one. It is highly improbable that this will ever come about; but it was considered that the Committee might usefully draw up a scheme which the Society could recommend to those who desire to publish pedigrees of human inheritance. Then, should these proposals meet with a favourable reception, it may be hoped that the scheme will be more and more used for work, and that many authors who now invent for themselves means of representing pedigrees will, in future, adopt the scheme described below.

The conclusions to which the Committee came will now be given as shortly as possible, and they should be read with reference to the pedigree on page 390 which has been constructed to illustrate all the various points. There will then follow some discussion of these proposals together with the reasons which prompted the Committee to adopt the more essential points of the scheme.

It should be noted that a *sibship* is here used to mean a group of individuals with both parents in common, and a *sib* a member of such a group either male or female.

### SCHEME ADOPTED BY THE RESEARCH COMMITTEE.

- I. (a) The pedigree is to be represented by a descending tree.
- (b) A horizontal bar, afterwards called the sibship coupling bar, is to be drawn for each sibship, and

from it vertical lines are to descend to the symbols representing each sib, and an ascending vertical or oblique line is to connect it with the coupling line between the parental symbols.

- (c) In the case of twins the symbols representing them are not to be directly connected with the sibship coupling bar; a horizontal line is to be drawn connecting the symbols and on to this line a vertical bar is to descend from the sibship coupling bar.
- (d) The sibs to be arranged in order of birth, the eldest being placed at the left-hand end.
- (e) When the fraternity is incomplete or there is any doubt as to the order of birth or any other matter, a clearly worded note explaining to what cause (*e.g.*, ignorance, parents only recently married, etc.) the incompleteness is due, or in what particular point there is room for doubt, is to be placed when space allows below the row of symbols by which the sibship is represented, or if this is impracticable, below the whole pedigree, using the Roman numeral and letter denoting the sibship for reference.
- (f) For purposes of reference each generation is to be represented by a Roman numeral, each sibship by a letter, and each individual by an Arabic numeral denoting its position in the sibship in order of birth. The Roman numerals and the letters are to be written boldly on the left-hand side of and on a level with the sibship coupling bar, the Arabic numerals to the left of and somewhat above the individuals which they represent. Any sib in the pedigree can thus be referred to clearly by quoting the generation number, sibship letter and individual number.
- (g) The symbol denoting the mate of any sib to be connected to it by a horizontal coupling line, which is to be continuous in the case of legitimate marriages, and a broken or dotted line when the union is an irregular one.

- (h) Husbands and wives of members of a sibship to be referred to by small Greek letters in conjunction with the reference numbers of their mates.
- II. The male to be represented by a square and the female by a circle. Where the sex is uncertain a triangle may be used. Several individuals in one sibship may be included in an enlarged symbol with the number of individuals written within.
- III. When the inheritance of any particular character, pathological or otherwise, is being investigated, its distribution in the family may be represented by blacking in the symbols denoting the individuals who exhibit it.
- IV. (a) Capital letters, or combinations of a capital letter and a small letter, written inside the symbol are to be used to denote certain particular conditions. The significance of these is to be in accordance with the following schedule :—
- |                  |                |             |
|------------------|----------------|-------------|
| T. tuberculosis  | S. syphilitic  | Ca. cancer  |
| I. insane        | A. alcoholic   | (including  |
| F. feeble-minded | C. criminal    | Sarcoma)    |
| Id. idiot or     | B. blind       | ? condition |
| imbecile         | D.M. deaf mute | unknown     |
| E. epileptic     |                |             |
- Ability may be represented by four diametral lines, making equal angles with one another at their point of intersection.
- (b) It is of the greatest possible importance that each user of these symbols should define clearly the sense in which he employs them.
- (c) Any conditions may be indicated according to the discretion of the recorder by blacking in a part of the symbols.<sup>1</sup> (It may further at times be found useful to divide the area of the symbol into three

<sup>1</sup> Examples of ways in which this blacking in may be done,



equal parts to represent respectively the physical, mental and sociological qualities. These areas may then be left white to indicate a balance of advantageous, or made black to indicate a balance of disadvantageous qualities.)

- (d) When use is made of symbols of this description a key to their meaning is to be placed on each page on which pedigrees are recorded.
  - (e) Any symbol given in the schedule IV(a) is not to be used to signify any condition except that which it indicates according to the schedule.
  - (f) Conditions only met with in one or very few individuals in a family, when they cannot be represented by any of the symbols in the schedule to IV(a), shall be described in footnotes or tables referring to the individuals contained in the pedigree.
  - (g) In order to call attention to the fact that there is a footnote or particular description referring to any individual, a small black circle may be drawn just below the square or circle representing the individual.
  - (h) The notes shall be arranged in the numerical order of the generations and the alphabetical order of the sibship and within the sibship in the birth order.
- V. (a) Certain particulars about the death of the individuals may be recorded in the pedigree chart by means of letters and numbers written below the squares or circles, and, when it is used, below the black circle referred to in IV(g).
- e.g.* D. shall signify dead and a number written beside it at the age at death.
  - D. 81 shall signify died at the age of 81.
  - D. s. shall signify suicide, the age at death can be represented in this case also by a number.
  - D. s. 81 shall signify suicide at age of 81.
  - (b) A smaller symbol with a diameter one-third of that of an ordinary symbol is to be used for still-births and miscarriages; and a symbol two-thirds of the

diameter of an ordinary symbol is to be used for "died in infancy" (*i.e.*, under one year).

It is not necessary to add much to the explanation of the proposed scheme given above. It may be as well, however, to amplify the meaning of some of the clauses and explain the reasons which weighed with the Committee in adopting certain features.

In the first place the scheme is intended particularly to apply to charts prepared for publication, in which the use of different colours is very undesirable, especially from the point of view of expense. There is less need for standardizing lecture diagrams, which may often be improved by the use of different colours.

With regard to the general form of pedigree the descending tree is by far the most widely used and seems to be much clearer than any other system. Its weak point is that where the pedigree is a long one, it takes very little space at the top of the page compared with that taken up at the bottom. Pedigrees, however, are seldom so lengthy and detailed as to make this feature a serious drawback; the loss in clearness involved by the system of representing pedigrees by spirals, as is sometimes done in Germany, is a more serious disadvantage. It will be noticed that the method of numbering and lettering recommended not only makes it easy to refer to any individual and the mate of any individual, but also shows to what generation such an individual belongs, and what is his or her place in the sibship with respect to order of birth.

The feature in the scheme to which exception is most likely to be taken is the representation of males and females by squares and circles. In England this system is more of a novelty than elsewhere. It is already largely used in Germany and America. Throughout the preparation of this scheme the Committee has endeavoured not so much to invent the ideally best method of drawing a pedigree as to select what they considered best in the schemes which are widely in use at the present time; and the squares and circles have only been adopted in view of the fact that they are already often employed. It must be remembered that the ♂ and ♀ symbols, though

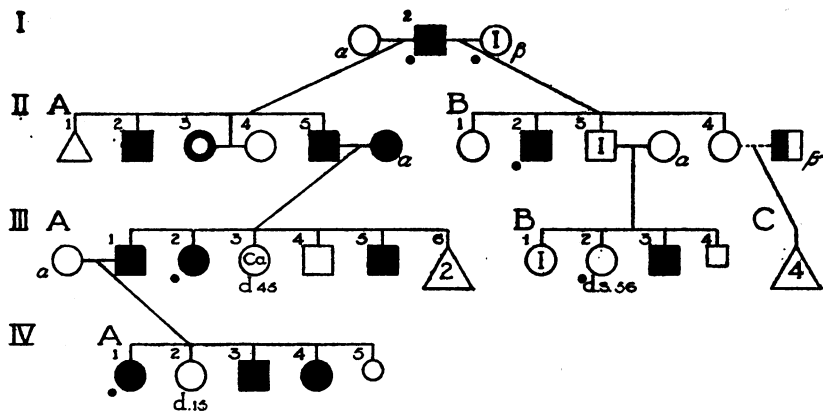
familiar to biologists, are not known to those who have no biological knowledge, and that, therefore, the squares and circles will be no more unfamiliar to many of those whom work in heredity and eugenics interests, than the above mentioned symbols. The chief point in favour of the squares and circles is that they are much clearer than the ♂ and ♀ signs. To make the latter signs really clear, it is necessary to draw the lines outside the circles of some size; and, if this is done, either far more room will be occupied by these symbols than by the symbols suggested, or the area of the circle will be restricted; it will be seen later the restriction of the circle is undesirable since it forms part of the scheme to place letters within them in order to indicate certain characteristics. It is this undoubted gain in clearness which has induced the Committee to adopt this feature.

The methods recommended for indicating particular characteristics of individuals shown on the pedigree chart are dealt with in sections III. and IV. The general idea is that fairly definite conditions should be represented by letters placed within the symbols in accordance with the schedule given in IV(a). Where one particular characteristic is being investigated, as is the case with most pedigrees, then all those individuals showing that characteristic are to be represented by symbols fully blacked in. Let us suppose that the sample pedigree given on page 390 deals with a family of alcoholics, then the fully blacked in symbols represent the alcoholic members of the stock; individuals exhibiting characteristics which also come within the schedule in IV(a) are represented by symbols containing letters indicating those characteristics as is the case with regard to I<sub>2</sub>β, II B<sub>3</sub>, and others. The advantage of this system is that the individuals exhibiting the characteristic which is especially under investigation are made obvious with the first glance at the pedigree. Further in accordance with paragraph IV(c) ample latitude is given to the recorder to invent methods of indicating any other characters which he may wish to be shown. But it is of the greatest possible importance that the meaning of every symbol, including those given in the schedule, should be defined. In the

case of alcoholism, for example, it must be clearly stated what is meant by this very wide term. Again, it is useless to mark certain individuals as blind without saying whether or not blindness due to accident is included, and so on. Therefore, whether the symbol used is one given in the schedule or if it is one invented at the discretion of the recorder, it must above all things be carefully defined.

Other points of interest about any individual can be recorded in footnotes; to draw attention to those individuals with reference to whom there is a note, a black dot is placed below and to the left of the symbols representing them. It is not desirable to overload the pedigree chart with details, but as explained in section V certain particulars with reference to the deaths of which something is known may be entered.

There are certain features of the scheme that are brought out by the sample pedigree on page 390 II A<sub>1</sub> is the eldest member of the fraternity. In this case the recorder was certain that one such individual existed but no further information was available even as regards sex. In the case of III A<sub>2</sub> the recorder knew of two individuals coming last in order of birth but similarly knew nothing else about them. It should be noticed that the union between II B<sub>4</sub> and II B<sub>4</sub> $\beta$  is an irregular one, and is therefore represented by a dotted line. Both III B<sub>4</sub> and IV A<sub>5</sub> died in infancy, are represented by symbols two-thirds the size of a normal symbol. II A<sub>3</sub> and II A<sub>4</sub> are twins. The symbols representing II A<sub>3</sub> and II B<sub>4</sub> $\beta$  are partly blacked in according to two different methods to represent some special feature. A key to those symbols is given at the bottom of the page. The method of noting information with regard to death is shown in the cases of III A<sub>3</sub>, III B<sub>2</sub>, and IV A<sub>2</sub>. Lastly, it will be observed that the husbands and wives are placed alongside their mates on the same horizontal level; according to some schemes they are placed at a lower level; the latter method certainly gives somewhat increased clearness, but the extra amount of space required has been considered by the Committee as an argument against its adoption.



## Descriptive Notes on I. 2.

" " I. 2 $\beta$ 

" " II. B. 2.

" " III. A. 2.

" " III. B. 2.

" " IV. A. 1.

Key to special symbols.



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